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March 1, 2010

Mr. S. Derek Phelps Executive Director Connecticut Siting Council 10 Franklin Square New Britain, CT 06051 TONGERICAL

CONTECTION

CONTEC

RE: Docket No. F-2010 – Connecticut Siting Council Review of the Ten-Year Forecast of Connecticut Electric Loads and Resources

Dear Mr. Phelps:

The United Illuminating Company (UI) hereby submits an original and twenty (20) copies of an Update to its Load Forecast and Transmission Planning in order to assist the Connecticut Siting Council in its Hearings pursuant to Section 16-50r of the General Statutes of Connecticut.

Respectfully submitted,

THE UNITED ILLUMINATING COMPANY

Michael A. Coretto

Associate Vice President - Regulatory &

Legislative Affairs

MAC

## Report to the Connecticut Siting Council on Loads and Transmission Resources

March 1, 2010

The United Illuminating Company 157 Church Street New Haven, CT 06506

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### Section I. Load Forecast Update

This section presents the results and a summary of the methodology for The United Illuminating Company's ("UI" or "Company") most recent ten-year energy sales forecast (Sales Forecast) and ten-year system peak load forecast (Peak Load Forecast). The Sales Forecast is used for budgeting and financial planning purposes. The Peak Load Forecast is used by the Connecticut Siting Council ("Council" or "CSC") for resource planning purposes in Connecticut. The two forecasts use different forecasting methodologies chosen to fulfill their intended purpose.

### Sales Forecast Purpose & Methodology

The primary purpose of the Sales Forecast is to accurately project monthly sales-by-class which is then converted to a revenue forecast using electric service rates by class. The principal output of the Sales Forecast is monthly energy sales. UI utilizes the ten-year Sales Forecast for a number of purposes. A key use of the Sales Forecast is to project the energy sales as the basis for predicting revenue over the next 12 to 24 months. The UI Sales Forecast produces monthly forecasted energy sales weather-adjusted to "normal weather" or average weather conditions.

Weather has a large impact on both sales and peak load. Any analysis of the actual historical sales and peak load must consider the weather conditions under which those sales and peak loads occurred. The Company's sales forecasting process begins by weather-adjusting the actual, customer-class specific, historical sales data to the sales that would have been experienced under normal weather, using heating degree days (HDD) and cooling degree days (CDD) based on a standard of 65 degrees Fahrenheit for the transition from heating-based to cooling-based sales.

The sales forecasting process then moves to the creation of a Base Energy Sales Forecast which reflects the projected sales from UI's existing base of customers. The Base Sales Forecast development employs focused analytical processes that weather-adjusts and evaluates the most recent energy sales history of its customers, trends in the local and state economies and the sales forecast team's interpretations of how these factors are likely to impact UI's future monthly sales.

The impact to sales from Conservation and Load Management (C&LM) and Distributed Generation (DG) currently on the UI system are embedded in the historical data used to develop the Base Energy Sales Forecast, and therefore, the future impact of these resources is accounted for in the Base Energy Sales Forecast results. UI adds to the Base Energy Sales Forecast the projected future annual impact of incremental additions of new C&LM and DG to account for the future additions of these resources.

In addition, UI adds an estimate of sales resulting from specific, new customers projected by UI's Economic Development group. The addition of new customers is another variable that can materially impact sales and peak loads. UI's Economic Development group creates regular projections of new customer additions and deletions to the system based on their interaction with municipalities, Account Managers, potential developers and businesses. These new loads include expansions of existing UI customers, redevelopment of existing areas and new "green field" construction. UI's final Sales Forecast results from the summation of the normal weather-adjusted Base Energy Sales Forecast and new large customer sales along with the decrement to sales due to projected C&LM and DG.

### Peak Load Forecast Purpose & Methodology

The purpose of the peak load forecast shown in Exhibit I is to allow the Council to effectively forecast and evaluate the demand and supply balance in Connecticut. The primary output of UI's Peak Load Forecast is the forecast of system peak loads under both normal and extreme weather conditions. Normal weather or average weather, also referred to as a 50/50 forecast, means the data provides a 50% confidence, from a statistical perspective, that forecasted normal weather-adjusted system peak will be exceeded 50% of the time on the peak load day, due to weather conditions. Extreme weather, also referred to as a 90/10 forecast, means the data provides a 90% confidence, from a statistical perspective, that the forecasted extreme weather-adjusted system peak will be exceeded only 10% of the time on the system peak day, due to weather conditions. In other words, the forecasted 90/10 peak load will be reached or exceeded once every ten years.

The UI Peak Load Forecast is a derivative of a quarterly sales forecast and forecasted customer class-level load factors. The forecast of quarterly sales used for the Peak Load Forecast is strictly an interim calculation step that utilizes a different forecasting methodology than the revenue-focused Sales Forecast described above. The Peak Load Forecast is derived from weather-adjusted sales that use an average monthly temperature methodology to weather-adjust the sales. This is different than the method used in the revenue-focused Sales Forecast described in the prior section. For the Peak Load Forecast development, the Company first uses customer-class specific regression models to weather-adjust the historic sales data to equivalent sales that would be seen under normal weather conditions based on 30-years of historical weather data. The normal weather-adjusted sales data is then used to develop a series of econometric models for each major customer class which relates the sales to economic and demographic drivers, obtained from independent sources. The parameters used in the individual

econometric models vary by the customer class. The models are then used to produce forecasts of quarterly sales for each major customer class under normal weather conditions.

Next, UI calculates the weather-adjusted historical system peak loads, for both normal weather and extreme weather conditions. The weather-adjustment for historic peak loads is based on a model that relates the twelve-hour average Temperature Humidity Index (a mathematical formula that combines temperature and humidity into a single number) to historical summer weekday peak loads (THI Model). The THI Model is then used to adjust historic peak loads to the loads that would have been seen under normal or average temperature and humidity conditions and for extreme conditions.

The weather-adjusted sales and peak loads in conjunction with load research data are used to calculate historical class-level load factors and forecast class-level load factors for both normal and extreme weather conditions. The forecasted class-level load factors are then used to translate the class-level annual sales into a Base Load Forecast for both normal and extreme weather-adjusted conditions. The Base Load Forecast reflects the forecasted peak load resulting from UI's existing levels of C&LM, DG and existing base of customers. Similar to the Sales Forecast, the Company accounts for projected new C&LM, DG and new or removed large customer loads separately. UI's final Peak Load Forecast results from the summation of the Base Load Forecast and new or removed large customer loads along with the impact due to incremental additions of new C&LM and DG.

### Changes to 2010 Forecast Methodologies

This year, the Company has incorporated a refinement to further enhance its peak load forecasting methodology. As described above, and similar to the last few years, this year's long-range peak forecasting models utilize econometric models to forecast data by customer classes. However, in 2010, the Company used separate class-level load factor forecasts for both the normal and extreme weather Peak Load Forecast. The Company believes this enhancement will further improve the quality of the resulting Peak Load Forecast to continue to capture the recent historical and forecasted impacts of the current economic downturn and projected future recovery.

### Normal Weather-Adjusted Historical and Forecasted Data

The data shown in Exhibit 1 includes actual historical data for system energy requirements, sales and peak load. Exhibit 1 also includes historical and forecasted sales and peak load adjusted to normal weather conditions. UI is a summer peaking utility due primarily to the air conditioning loads on its system. During recent history, between 2000 and 2009, UI has experienced lower normal weather-adjusted sales growth as compared to its normal weather-adjusted peak load growth (i.e., -2.0% sales growth versus a +3.6% peak load growth in the past nine-years). This is attributed to changes in customer behavior regarding energy usage, the unprecedented recession along with an increase in air-conditioning loads. It should be noted that in three of the last nine years of historical data (2001, 2002 and 2006), the actual peak load has exceeded the normal weather-adjusted peak load. This exceedance is consistent with the design of the normal weather adjustment, in that, typical variations in weather alone will cause the normal weather-adjusted value to be exceeded 50% of the time on the peak load day. This recent

history of peak loads reinforces the need for the Company to consider extreme weather in its Peak Load Forecasts. The forecast of the normal weather-adjusted peak load projects a growth of 17.3% between 2009 and 2019. However, the forecast of sales projects a decline of -2.1% during the same period due to the projected small incremental sales increases from the existing customer base and new customers being more than overcome by the sales reductions resulting from incremental C&LM and DG additions. The Sales Forecast is lower than last year's forecast due to the impacts of the current economic conditions. The normal weather-Adjusted Peak Load Forecast is also lower than last year's forecast (56 MW lower in year 2018).

### Extreme Weather-Adjusted Historical and Forecasted Data

In addition to the normal weather-adjusted data, Exhibit 1 also shows historical and forecasted peak loads adjusted to extreme weather conditions. The 2000 to 2009 historical data in Exhibit 1 shows a growth in the extreme weather-adjusted historical Peak Loads that is more than double the growth seen in the historical normal weather-adjusted Peak Loads (i.e., 8.0% growth in extreme weather peak load versus 3.6% growth in the normal weather peak load). The Company's extreme weather-adjusted Peak Load Forecast shows a growth of 18.2% during the period from 2009 to 2019. This forecasted growth is higher than last year's forecast due to the impacts of a forecasted stronger economic recovery during this period. While the extreme weather-Adjusted Peak Load Forecast percentage growth is higher for the this year's forecast than last year's forecast (for the full ten-year period of the respective forecast); the forecasted peak in year 2018 is 15 MW lower than last year's forecast due to the economic impact on the actual 2009 peak load.

The ability to predict when extreme weather will occur or the exact amount of economic activity that will be realized is always problematic. Therefore, prudent planning requires that the

possibility of the effects of extreme weather (i.e., high temperatures and high humidity) within the forecast time period be recognized, as well as appropriate assumptions of future economic development activity. Plans must be formulated to meet this possible demand. The bounds of the Company's forecasts from the normal and extreme weather-adjusted scenarios are intended to provide a plausible range of futures. No single forecast will be accurate throughout the forecast period. When extreme weather occurs, regardless of the timing, the system infrastructure must be in place to serve the load safely and reliably.

### UI Peak Load Scenario for ISO-NE Regional Transmission Planning

In addition to this filing to the Council, the Company must also file a forecast of peak loads to the Independent System Operator-New England ("ISO-NE") as input to ISO-NE's regional planning process. A preliminary forecast of peak loads that the Company intends to provide to ISO-NE is provided for informational purposes in Exhibit 2. This Peak Load Scenario excludes all C&LM, DG and potential new large customer loads in order to be consistent with the ISO-NE treatment of loads and resources in their regional planning.

### **Distributed Generation**

The Connecticut General Assembly passed a landmark legislative initiative in 2005:

Public Act 05-01, June Special Session, *An Act Concerning Energy Independence* ("PA 05-01").

The implementation of the Act, carried out by the DPUC, provides monetary grants to offset the capital cost of installing DG. Despite these capital grants, the decision of whether or not such an installation is economically attractive is unique to each customer. As such, the remaining number of installations that may occur under the Act is difficult to predict.

<sup>&</sup>lt;sup>1</sup> The purpose of the peak load forecast shown in Exhibit I is to allow the Council to effectively forecast and evaluate the demand and supply balance in Connecticut.

Since the inception of the program, approximately 11.2 Megawatts<sup>2</sup> of DG capacity have become operational in the UI service territory while additional grants totaling 33.7 Megawatts of capacity have been approved. The in-service dates for these additional units are under the control of the owners, but all of these units are scheduled to be operational over the next few years. In development of the sales forecast shown in Exhibit 1, those projects no longer anticipated have been excluded from the sales forecast and an 85% capacity factor was utilized for forecasted units. The incremental impact of DG to the sales forecast is shown in Table 1.

Table 1 – Incremental Annual Impact of DG to Sales Forecast

| Year | Reduction in Energy<br>Sales due to DG<br>(GWhrs) |
|------|---|
| 2010 | 79  |
| 2011 | 67  |
| 2012 | 102   |
| 2013 | 20  |
| 2014 | -   |
| 2015 | -   |
| 2016 | -   |
| 2017 | -   |
| 2018 | -   |
| 2019 | -   |

In development of the peak load forecasts presented in Exhibit 1, all of the operational units have been included as offsets to load (utilizing actual generator output). Regarding forecasted units, only half of the units that have received grant approval have been included as offsets to load. Table 2 presents the incremental impact to system peak due to DG.

<sup>&</sup>lt;sup>2</sup> Operational DG output is based on capacity listed on grant application and not the actual generator output.

Table 2 – Incremental Annual Impact of DG to Peak Load Forecast

| Year | Reduction in System Peak Load Forecast due to DG (MW³) |
|------|--|
| 2010 | 10.68  |
| 2011 | 6.09   |
| 2012 | -  |
| 2013 | <u> </u>   |
| 2014 | -  |
| 2015 | -  |
| 2016 | -  |
| 2017 | -  |
| 2018 | -  |
| 2019 | <b>I-</b>  |

The DPUC has evaluated this grant program for cost effectiveness to the ratepayers and, as a result of this evaluation, has ended the program. The change to the monetary grant program took effect for all projects that submitted applications on or after October 14, 2008.

<sup>&</sup>lt;sup>3</sup> Values are based on 50% of the projects that have received DPUC grant approval and represent estimated customer metered values. For UI's system load, these reductions were 'grossed-up' using the system loss factor.

### Conservation & Load Management

In 2010, the transition period for the Forward Capacity Market ("FCM") will end, and the FCM will be put in place. New England's energy markets continue to develop and evolve, and the Company continues to be an active participant in the development of the ISO-NE stakeholder process to refine the markets. The new FCM allows market participants to bid their peak demand savings into the capacity market. Market participants earn capacity payments for qualifying resources, such as distributed generation, energy efficiency, load management or load response. This is the first time in the United States that reduction in demand through energy efficiency and demand response programs was considered as electrical capacity equivalent to supply-side generation sources. Additional electrical capacity "produced" through the implementation of efficiency and load management measures becomes a resource, which can then be bid to ISO-NE on a level playing field with new generation.

UI has entered peak demand savings from energy efficiency and load management projects into the transition period FCM on behalf of the Connecticut Energy Efficiency Fund and has successfully bid capacity in the first three capacity auctions.

PA 07-242, An Act Concerning Electricity and Energy Efficiency ("2007 Act") required the Companies to begin an integrated resource planning ("IRP") process. On January 1, 2010, the Companies submitted their third IRP plan to the CEAB. The 2010 IRP has two additional resource strategies for Demand Side Management (DSM) that are above and beyond the reference level DSM (business as usual) strategy. The targeted DSM strategy is comprised of specific initiatives that will achieve zero load growth in Connecticut in five years and a slight reduction thereafter. The All Achievable Cost-Effective DSM strategy reflects a major expansion of current programs and was constructed based on a draft Connecticut energy

efficiency potential study completed in 2009 by the Energy Conservation Management Board ("ECMB").

The American Recovery and Reinvestment Act of 2009 ("Stimulus Act") also provided Connecticut with significant resources for energy efficiency. In 2009 UI received \$2.3 million from the Stimulus Act and allocated it towards our Homes Energy Solutions, Energy Opportunities and Small Business programs. Connecticut received an additional \$3.4 million for an appliance rebate program.

The strategic focus of UI's programs is the result of a multi-level collaborative process involving UI and a diverse group of stakeholders. These stakeholders include: the Department of Public Utility Control, the ECMB, Connecticut state government, consumer and business interests, national and regional environmental and energy efficiency organizations, design professionals and energy services providers.

UI participates in national and regional activities to develop a long-range focus for energy efficiency. The organizations include the Consortium for Energy Efficiency ("CEE"), the American Council for an Energy-Efficient Economy ("ACEEE"), Northeast Energy Efficiency Partnerships ("NEEP") and other utility and public benefit fund organizations. The activities include market baseline research, development of efficiency standards, exchange of programmatic ideas and concepts and the assessment of the need for incentives. These efforts have produced many of the energy efficiency concepts and measures upon which the programs are based.

Table 3 illustrates the incremental impact of C&LM programs to the sales forecast.

Table 3 – Incremental Annual Impact of C&LM to Sales Forecast

| Year | Reduction in Energy<br>Sales due to C&LM<br>(GWhrs) |
|------|---|
| 2010 | 64  |
| 2011 | 65  |
| 2012 | 57  |
| 2013 | 53  |
| 2014 | 50  |
| 2015 | 50  |
| 2016 | 50  |
| 2017 | 50  |
| 2018 | 50  |
| 2019 | 50  |

Table 4 shows the incremental annual impact of DG to the peak load forecast.

Table 4- Incremental Annual Impact of C&LM to Peak Load Forecast

| Year | Reduction in System            |  |
|------|--------------------------------|--|
|      | Peak Load Forecast             |  |
|      | due to C&LM (MW <sup>4</sup> ) |  |
| 2010 | 9.20                           |  |
| 2011 | 9.26                           |  |
| 2012 | 8.58                           |  |
| 2013 | 8.20                           |  |
| 2014 | 7.84                           |  |
| 2015 | 7.88                           |  |
| 2016 | 7.93                           |  |
| 2017 | 7.94                           |  |
| 2018 | 7.97                           |  |
| 2019 | 7.98                           |  |

<sup>&</sup>lt;sup>4</sup> Values represent estimated customer metered values. For UI's system load these reductions were 'grossed-up' using the system loss factor.

### Section II. Transmission Planning

The combination of the development of the competitive wholesale generation marketplace and the capacity requirement to accommodate increasing levels of forecasted peak demands has impacted transmission system utilization. The UI projects included in this filing are a result of the impact of these factors on the existing infrastructure. These projects will enable the Company to fulfill its obligation to provide reliable service to its customers and to meet the reliability standards mandated by national and regional authorities responsible for the reliability of the transmission system: the North American Electric Reliability Corporation (NERC), the Northeast Power Coordinating Council (NPCC) and ISO-NE.

The on-going restructuring efforts in the electric industry at the state and federal levels have brought about numerous significant changes. The move towards open access to competing generation resources has resulted in changes in generating patterns due to competitive pricing and the siting and operation of merchant generating facilities. This has now become an additional impetus for transmission infrastructure upgrades. Prior to restructuring, changes to the transmission system had been undertaken predominantly to accommodate area load growth, maintain system reliability and voltage, and/or upgrade aging facilities. Generation-related transmission upgrades had been limited to the addition or retirement of planned, specific generating units. Now, transmission upgrades also assist in the development of the competitive wholesale generation marketplace and also help reduce the economic penalties paid by Connecticut's electricity ratepayers as a result of limitations on the ability to import lower cost generation.

Recent regulatory developments regarding renewable electric generation and emissions may provide impetus for additional transmission projects in the future. Connecticut, like other New England states, has established a substantial renewable portfolio standard (RPS) that ramps

up over time to approximately 14% of energy in 2010 to 27% of energy in 2020 for all Classes of renewables. New England's requirements for generation from renewable resources are projected by ISO-NE to be ramping up from approximately 9,000 GWh in 2009 to approximately 26,000 GWh in 2020.5

For Connecticut, and likely other southern New England states, it appears it will be difficult to satisfy the RPS exclusively with domestic (in-state) assets. There may be significant renewable potential in northern New England states, for example Maine, New Hampshire, and Vermont. In addition, substantial potential exists in adjoining regions, including the Canadian provinces. In a recent preliminary assessment, ISO-NE indicated that the eastern Canadian provinces have potential in excess of 13,000 MW of renewable resource capacity.<sup>6</sup>

It appears that the majority of renewable potential is remote from load in New England. To the extent the renewable needs cannot be satisfied locally or through alternative compliance payments, additional transmission projects may be necessary to tap remote renewable-rich regions and facilitate import of remote renewable generation. In September of 2009, the New England Governors published an "Energy Blueprint." To inform the New England Governors, and other policy makers, New England States Committee on Electricity ("NESCOE") requested that ISO-NE conduct a Renewable Development Scenario Analysis (RDSA) which subsequently established that:

"A number of potential transmission projects can be identified that would allow for the reliable transfer of power from off-shore and on-shore wind resource regions to load across New England, and for export to our neighbors. The length of such transmission is modest on a national scale given the region's relatively small geographic footprint. The cost associated with such transmission varies significantly depending on the level of

<sup>&</sup>lt;sup>5</sup> ISO-NE Regional System Plan Update, October 2009. <sup>6</sup> ibid

overall resource development: a lower level of investment would result in renewable resources sufficient to meet our renewable energy goals while more aggressive investment could enable New England to export renewable power to neighboring regions."<sup>7</sup>

UI's planned transmission system modifications are listed in Exhibit 3 and are outlined below.

To address reliability, substation capacity and voltage support issues in the greater New Haven area, UI has received approval of Declaratory Rulings from the Council that no Certificates of Environmental Compatibility and Public Need are required for the following projects:

- Broadway 115/13.8-kV Substation Expansion Project
- Union Avenue Metro North 115/26.4-kV Substation Project

The Broadway 115/13.8-kV Substation Expansion Project and the Union Avenue – Metro North 115/26.4-kV Substation Project are expected to be completed by December 2010 and August 2011 respectively.

In 2009 the Council also approved a Declaratory Ruling regarding UI's proposed Grand Avenue 115-kV Switching Station Modernization Project, which addresses reliability compliance issues in the greater New Haven area. The Grand Avenue 115-kV Switching Station Modernization Project is expected to be in service by May 2012.

UI has other transmission infrastructure upgrades under internal review, such as the Shelton Substation Project, a new 115/13.8-kV substation, needed to address distribution reliability and capacity issues related to substation thermal overloads and voltage collapse

<sup>&</sup>lt;sup>7</sup> New England Governors' Renewable Energy Blueprint, September 15, 2009, page 15, item 6.

concerns in the greater Shelton area. UI anticipates making a filing with the Council for this project in 2013, which is projected to be in service in 2016.

The North Branford Substation Project is a new 115/13.8-kV substation needed to address distribution reliability and capacity issues related to substation thermal overloads and voltage collapse concerns in the greater North Branford area. The Company anticipates a 2013 filing with the Council for this project which is forecasted to be in service in 2016.

The New Haven Substation Project is a new 115/13.8-kV substation needed to address distribution reliability and capacity issues related to substation thermal overloads in the greater New Haven area. UI anticipates a 2016 filing with the Council for this project which is projected to be in service in 2019.

The Naugatuck Valley area (Ansonia, Derby and Shelton) of UI's service territory is presently supplied by three 115/13.8-kV distribution substations: Ansonia, Indian Well and Trap Falls. These substations are connected to the 115-kV transmission system via CL&P's and UI's overhead transmission lines. Presently, these lines no longer provide an adequate 115-kV voltage supply to the area, and are at risk of local voltage collapse following contingency conditions. UI is also concerned with outage exposure, due to a single contingency, to nearly 30,000 customers (approximately 9% of UI's customer base) supplied from Indian Well and Ansonia substations. UI anticipates making a filing with the CSC for the Naugatuck Valley 115-kV Reliability Improvement Project in 2012, which is expected to be in service in 2014 (representing a change from 2013 as presented in last year's report).

To address 115-kV short circuit interrupting capability issues in the greater Bridgeport-Milford area, UI is evaluating alternatives for a Pequonnock 115-kV Fault Duty Mitigation Project, expected to be in service by 2015 (representing a change from 2013 as presented in last year's report). In 2010, UI, CL&P and ISO-NE are expected to complete the necessary studies

to provide a conceptual solution for the Pequonnock 115 kV Fault Duty Mitigation Project. UI anticipates making a filing with the CSC for this project in 2012.

On September 1, 2005, the FERC issued a notice of proposed rulemaking for the establishment of an Electric Reliability Organization (ERO). This was in response to the newly enacted Energy Policy Act of 2005, which in part directed FERC to establish an ERO, and develop mandatory electric reliability standards and enforcement procedures for reliability violations. NERC has since been selected as the ERO and is in the process of setting mandatory standards and penalties for non-compliance. UI must now respond to NERC's expanding role and new requirements for maintaining system reliability.

UI is unaware of any instances where a UI transmission line exceeded its long-time or short-time emergency rating during abnormal system conditions. UI and CL&P in conjunction with CONVEX (the Connecticut Valley Electric Exchange), ISO-NE, and NEPOOL periodically review the performance of the transmission system as part of a coordinated effort to provide adequate and reliable transmission capacity at a reasonable cost.

Please note that Exhibit 3 to this Report includes only those planned transmission projects that UI is responsible to undertake. It does not include any plans or proposed actions by third parties that would require transmission system modifications in UI's service territory. It would be the responsibility of such third parties to provide the CSC with a report of their plans as appropriate. Any such proposed modifications would require notification and coordination with UI so the Company can assess the impacts on its transmission system and ensure the system's continued reliability.

### Section III EXHIBITS

# System Energy Requirements, Annual Sales, and Peak Load Table **EXHIBIT 1**

System Energy Requirements, Annual Sales, and Peak Load The United Illuminating Company

|                    |         |           |                      |        |        |        |               |          | Nor           | Normal Weather Adjustment | iustment |        | Extren        | ne Weat | Extreme Weather Adjustment | ant    |
|--------------------|---------|-----------|----------------------|--------|--------|--------|---------------|----------|---------------|---------------------------|----------|--------|---------------|---------|----------------------------|--------|
| History            |         |           |                      |        | Actual |        |               | Weather  |               | Weather                   |          |        | Weather       | ē       |                            |        |
| TISION A           | Total   | Annual    | Actual               | Annual | System |        | Load          | Adjusted |               | Adjusted                  |          | Load   | Adjuste       |         |                            | Load   |
|                    | o o     | Change    | Sales                | Change | Peak   | Annual | Factor        | Sales    | $\overline{}$ | System Peak               | Annual   | Factor | System Pea    |         |                            | Factor |
| Year               | (GWh)   | (Pet.)    | (GWh)                | (Pet.) | (MM)   | Change | (Pot.)        | (GWD)    | (Bet)         | (MM)                      | Ų.       | (Pat)  | (MW)          | Οı.     | <u>Change</u>              | (Pct.) |
| 900                |         |           | 5.652                |        | 1.273  | •      | 63%           | 5,625    |               | 1,219                     | ٠        |        | 1,28          |         | r                          | 1      |
| ess.               |         | 70 to C   | 2001<br>2001<br>2001 | %D O   | 1.157  | -9.1%  | 28%           | 5,708    |               | 1,236                     |          | 55%    | 1,29          |         | 3%                         | 53%    |
| 2002               |         | % S C     | 7.724                | 1 2%   | 1 324  | 14.4%  | 52%           | 5,689    |               | 1,259                     |          | 25%    | 1,32          |         | .3%                        | 52%    |
| 1002               |         | 76.0      | 787.7                | 10%    | 1310   | -1.1%  | 53%           | 5,684    |               | 1,259                     |          | 25%    | 1,31          |         | .2%                        | 25%    |
| 2002               |         | 3%        | 5 763                | %° 0-  | 1.281  | -2.2%  | 54%           | 5,716    |               | 1,285                     |          | 24%    | 1,35          |         | .5%                        | 51%    |
| 2002               | 1000    | %0.0      | 5,952                | %0 e   | 1201   | 6.3%   | 26%           | 5,952    | 4.1%          | 1,300                     | 1.2%     | 54%    | 1,36          |         | %6                         | 52%    |
| 1000               |         | 7.7.0     | 200. A               | 2.5%   | 1.346  | 12.1%  | 54%           | 5,995    |               | 1,353                     |          | 54%    | 1,42          |         | 7%                         | 51%    |
| 2002               |         | 2000      |                      | 3.5%   | 1.456  | 8 20%  | 48%           | 5.979    |               | 1,377                     |          | 51%    | 1,45          |         | %0.                        | 48%    |
| 2000               |         | 70.0      | 100                  | %00    | 1 298  | .10.9% | 54%           | 5,929    |               | 1,389                     |          | 20%    | 1,46          |         | .6%                        | 48%    |
| 2007               |         | 20.00     | 0,0                  | 3 2%   | 1304   | 9%     | 52%           | 5.709    |               | 1,379                     |          | 48%    | 1,46          |         | .2%                        | 46%    |
| 2008               |         | 200       | 5,753                | 75.7   | 252,1  | 3.7%   | 52%           | 5,593    |               | 1,280                     |          | 51%    | 1,39          |         | %6                         | 46%    |
| 5002               |         | _         | 284.0                |        |        |        |               |          |               | 7080                      |          |        |               |         |                            |        |
| 1999 - 2009 growtl | £.      | 4.5%      |                      | -2.8%  | 8 4    | •      | -1.0%<br>8.3% |          | . 1           | 20%                       |          | 3,6%   |               |         | 80.8                       |        |
| 2000 - 2009 grown  | Ė       | <u>\$</u> |                      | D Z-   | 9      |        |               |          |               |                           |          |        |               |         |                            |        |
|                    |         |           |                      |        |        |        |               |          | Non           | Normal Weather Scenario   | nario    |        | Extre         | eme We  | Extreme Weather Scenario   | ٥      |
| 40000              |         |           |                      |        |        |        |               | Weather  |               |                           |          |        |               |         |                            |        |
| LOISCASI           | 1000    |           |                      |        |        |        |               | Adjusted |               | System                    |          | Load   | Syster        | E       |                            | Load   |
|                    | Sue Dea |           |                      |        |        |        |               | Sales    | v             | Peak                      |          | Factor | Pea           | ak An   |                            | Factor |
| Yea                | (CWC)   | (Port)    |                      |        |        |        |               | (GWP)    | (Pct.)        | (MM)                      | Change   | (Pct.) | (MAA)         | ଣ<br>ଶ  | Change                     | (Pot.) |
| 0100               | 5 740   |           |                      |        |        |        |               | 5,461    |               | 1,332                     |          | 49%    | 1,4           | 103     |                            | 47%    |
| 2010               | 5,670   |           |                      |        |        |        |               | 5,394    |               | 1,380                     |          | 47%    | 1,4           | 345     |                            | 45%    |
| 2012               | 7,00    |           |                      |        |        |        |               | 5,314    |               | 1,435                     |          | 44%    | 1,5           | 514 4   |                            | 42%    |
| 2012               | 5,550   |           |                      |        |        |        |               | 5,289    |               | 1,458                     | 1.5%     | 44%    | £.            | 550 2   |                            | 41%    |
| 202                | 2000    |           |                      |        |        |        |               | 5,306    |               | 1,462                     | 0.3%     | 44%    | <u>د</u><br>ت | 1966    |                            | 41%    |
| 2005               | 000     |           |                      |        |        |        |               | 5,328    |               | 1,481                     | 1.3%     | 43%    | <u>د</u> -    | 399 2   |                            | 40%    |
| 2013               | 2,000   |           |                      |        |        |        |               | 5,372    |               | 1,486                     | 0.3%     | 43%    | 1,6           | 317     |                            | 40%    |
| 7000               | , c     |           |                      |        |        |        |               | 5,390    |               | 1,494                     | 0.5%     | 43%    | 9,1           | 339 1   |                            | 39%    |
| 202                | 200     |           |                      |        |        |        |               | 5,429    |               | 1,499                     | 0.4%     | 43%    | 1,6           | 346     |                            | 40%    |
| 0107               | 22.5    |           |                      |        |        |        |               | 5,475    |               | 1,502                     | 0.2%     | 44%    | 1,6           | 349 C   |                            | 40%    |
| 2013               | 10,0    |           |                      |        |        |        |               | ·        |               |                           | •        | 700    |               |         | 18 20%                     |        |

1.4%

2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 growth

18.2%

-2.1%

System Requirements are sales plus losses and Company use.
 Load Factor = System Requirements (MVN) / (8750 Hours X System Peak (MVN)).
 All forecasts include C&LM, DG & potential new large customer planned loads identified by Ul Economic Development.

### EXHIBIT 2 Peak Load Scenario for ISO-NE Regional Planning Process

### The United Illuminating Company

### Peak Load Scenario for ISO-NE's Regional Transmission Planning Process (Final forecasts to be provided to ISO-NE)

### Forecast

|                    | Normal We | eather Scenari | io Extreme Weath | er Scenario |
|--------------------|-----------|----------------|------------------|-------------|
|                    | System    | A              | System           | A           |
| V                  | Peak      | Annual         | Peak             | Annual      |
| <u>Year</u>        | (MW)      | Change         | (MW)             | Change      |
| 2010               | 1,343     | 4.9%           | 1,414            | 1.4%        |
| 2011               | 1,390     | 3.5%           | 1,455            | 2.9%        |
| 2012               | 1,446     | 4.0%           | 1,525            | 4.8%        |
| 2013               | 1,476     | 2.1%           | 1,568            | 2.9%        |
| 2014               | 1,488     | 0.8%           | 1,593            | 1.5%        |
| 2015               | 1,499     | 0.7%           | 1,616            | 1.5%        |
| 2016               | 1,512     | 0.9%           | 1,643            | 1.7%        |
| 2017               | 1,528     | 1.0%           | 1,673            | 1.8%        |
| 2018               | 1,542     | 0.9%           | 1,688            | 0.9%        |
| 2019               | 1,553     | 0.7%           | 1,700            | 0.7%        |
| 2009 - 2019 growth |           | 21.            | 3%               | 21.         |

<sup>1.</sup> All forecasts <u>exclude</u> C&LM, DG & potential new large customer planned loads identified by UI's Economic Development Department, consistent with ISO-NE CELT load forecasting methodology.

### **EXHIBIT 3 Transmission System Planned Modifications**

### Report to the Connecticut Siting Council

List of Planned Transmission Projects for which Certificate Applications are being contemplated, may be subject to Declaratory Ruling, or have already been filed

| Projects for which Certificate Applications are being Contemplated | kV  | Date of Completion |
|--|-----|--------------------|
| 1. Naugatuck Valley 115-kV Reliability Improvement Project         | 115 | 2014               |
| 2. Pequonnock 115-kV Fault Duty Mitigation Project                 | 115 | 2015               |
| 3. Installation of new 115/13.8-kV substation in Shelton           | 115 | 2016               |
| 4. Installation of new 115/13.8-kV substation in North Branford    | 115 | 2016               |
| 5. Installation of new 115/13.8-kV substation in New Haven         | 115 | 2019               |
|  |     |                    |
| Projects which have Received CSC Declaratory Ruling Approval       |     |                    |
| 1. Broadway 115/13.8-kV Substation Expansion Project               | 115 | 2010               |
| 2. Union Avenue – Metro North 115/26.4-kV Substation Project       | 115 | 2011               |
| 3. Grand Avenue 115-kV Switching Station Modernization Project     | 115 | 2012               |